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Massachusetts Field Guide to INLAND WETLAND PLANTS

THIS BOOK IS A COOPERATIVE EFFORT OF

The Massachusetts Audubon Society
The Massachusetts Division of Water Resources

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Cy Coleman - *1st Audubon International Exhibition of Nature Photographed Alder Catkins, Buds and Cones* [*p38*]
Henry B. Kane - *Cattails in Winter* [*p.13*], *Water-lily* [*p.18*], *Blue Flag* [*p.28*], *Black Alder* [*p.39*], *Marsh-marigold Plant* [*p.50*]
Dennis McGee - *Reed-Canary-Grass Flower* [*p.16*]
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Ken Wood - *Marsh* [*cover*], *Buttonbush Branch* [*p.15*], *Poison Sumac* [*p.41*], *Spicebush Leaves and Berries* [*p.51*], *Sweet Gale* [*p.59*]
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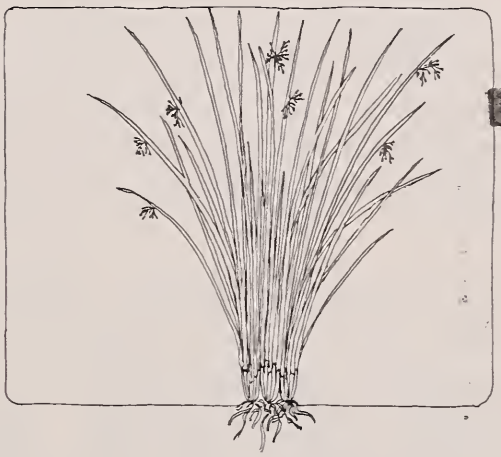

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INLAND WETLAND PLANTS OF MASSACHUSETTS

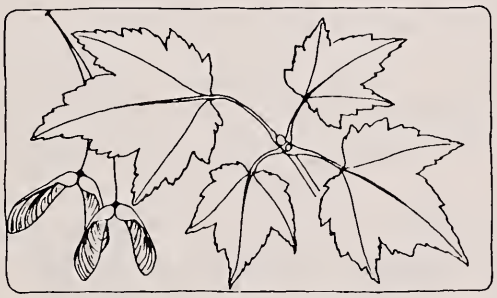
The inland wetlands and flood plains of Massachusetts are important not only for their natural resource values but also because they are an economic asset to the Commonwealth. They provide flood storage and control, pollution filtration, protection of ground and surface waters, and habitat for wildlife, fishes, and shellfish. While these characteristics have not been widely understood or appreciated in the past, we now know from hard experience that uncontrolled development on wetlands and floodplains impairs their function and can cause costly and irreparable damage to people, property, and wildlife.

With the recognition of wetland values and the immediate need to protect the remaining areas, the Massachusetts Legislature enacted several wetland laws in the 1960s and early 1970s. The Inland and Coastal Wetlands Restriction Acts (Chapter 131, section 40A; Chapter 130, section 105) authorize the state Department of Environmental Management to map, designate, and limit the use of certain wetlands and floodplains. The Wetlands Protection Act (Chapter 131, section 40) enables local conservation commissions to regulate development in or affecting wetlands and floodplains.

A major stumbling block in implementing these acts has been the lack of a reliable and visible method to determine (1) whether an area is a wetland, or (2) the location of the boundary between it and its surrounding upland. Following the lead of adjacent states, Massachusetts has recognized that wetlands and floodplains are definable by their plant communities and has codified the plant species by which an inland wetland may legally be defined.

The purpose of this Guide is to aid the non-botanist to identify fresh water wetlands through identification of their plant species. The Guide describes and illustrates the most common inland wetland plants in Massachusetts. Since all but one plant described in the Guide--Arrowhead, *Sagittaria latifolia*--are listed in the Massachusetts Wetlands Protection Act, this Guide is meant to serve as a supplementary tool for administering the Massachusetts law.

Some plants listed in the Wetlands Protection Act are not included in this Guide. For instance, plant species that float on the water surface are useful in identifiying a permanently wet area, but by the time an observer gets close enough to identify the plants, they are well aware that they are in a wetland! Other plants are omitted because they are relatively rare or difficult to identify.



The Massachusetts Wetlands Protection Act is administered locally by conservation commissions. The Department of Environmental Quality Engineering in the Executive Office of Environmental Affairs is responsible for establishing regulations and handling appeals at the state level.

USING THIS GUIDE

This Guide is divided into sections for each of the major inland wetland types in Massachusetts: Marshes, page 8 - 19; Meadows, page 20-31; Swamps, page 32-37; and Bogs, page 52 & 53. Check the photographs of these habitats in the Guide to help you identify them.

There are two initial steps to take when you want to identify whether the area you are concerned with is a wetland:

FIRST: Compare your area with the photographs of general wetland types to see whether it looks like any of them. However, don't get hung up trying to make it one type or another. Remember, wetlands are not always pure marshes, swamps, etc. There are often intermediate conditions. Thus, some of the plants which usually grow in swamps can appear in meadows, meadow plants can grow in marshes, and so forth. If there is a general resemblance between your area and any of the photographs, go on to the second step.

SECOND: Now that you have decided your area is probably a wetland and have identified its general type as best you can, examine the flowers, fruits, and leaves of the most common plants there and compare them to the illustrations and descriptions of plant species under habitat descriptions in this book. Even if you cannot definitely identify more than a few plants, don't despair. This Guide is only meant to be a tool to help you decide whether or not the area you are looking at is a wetland. If you think so, then more expert help may be needed. (See page 62, "Other Wetland References," or page 61, "Who to Call for Help in Identifying Plants.") On the other hand, if you have had some experience in plant identification,

this Guide should be adequate to help you decide whether the plants are wetland species or not and whether the area is a wetland or not.

It is important to remember the following points when using this Guide:

•One plant does not a wetland make! A single cattail may indicate wetness, but a wetland does not exist unless a number of wetland plants are found together. A community or group of wetland species over an area indicates a wetland.

•This Guide describes the most obvious identifying characteristics for each plant. Unfortunately, there are periods--even entire seasons--when these plants do not exhibit easily recognizable characteristics. In winter trees drop their leaves and must be identified by twigs, bark, or other means; soft-stemmed plants deteriorate and may become either unfindable or unrecognizable. Thus, when you are unsure of your wetland plant identifications, you must obtain the help of an experienced person or go to other references. For other references see page 61.

•Some plants grow in uplands as well as wetlands and floodplains. Nevertheless, if they are common to wetlands, they are included here.

•Grasses are often difficult to identify. The term "hydrophilic grasses" used in the law simply means water-loving grasses and does not designate a particular species. This Guide focuses on three species which are easily identifiable and definitely require wet habitats.

•Taste is not a good way to identify plants. Certain parts of many plants are POISONOUS.

PLANTS LISTED IN THIS GUIDE

MARSH	WET MEADOW
Arrow-arum - 10 & 11 *Arrowhead - 10 & 11 Pickerelweed - 10 & 11 Bur Reed - 12 Cattail - 13 Water-willow - 14 Buttonbush - 15 Hydrophilic Grasses: - Reed-Canary-Grass - 16 - Rice Cut-grass - 17 - Reed; Phragmites - 29 Water-lily; Pond-lily - 18 Spatterdock; Yellow Pond-lily - 19 *Not listed in Chapter 131 § 40	Tussock Sedge - 24 Wool-grass - 25 Umbrella-sedge - 26 Soft Rush - 27 Blue Flag; Iris - 28 Reed; Phragmites - 29 Purple Loosestrife - 30 Sensitive Fern - 31

PLANTS NOT LISTED

MARSH	WET MEADOW
Bladderwort Duckweed Eelgrass Frog's-bit Horsetail Pipewort Pondweed Water-Milfoil Water-Starwort	Vervain Thoroughwort; Boneset Dock Marsh-Fern Smartweed

LISTED IN CHAPTER 131 § 40

SWAMP	BOG
Shrub Swamp: Alder - 38 Winterberry; Black Alder - 39 Buttonbush - 15 Highbush-blueberry - 40 Poison Sumac - 41 Willows - 42 **Tree Swamp:** Black Ash - 44 Red Maple - 45 Tupelo; Black or Sour Gum - 46 Atlantic White Cedar - 47 Skunk-Cabbage - 48 False Hellebore; Indian Poke - 49 Marsh-marigold; Cowslip - 50 Spicebush - 51	Larch; Tamarack - 54 White Cedar - 36 & 37 Black Spruce - 55 Swamp Azalea; Clammy Azalea - 56 Cranberry - 57 Highbush-blueberry - 40 Leather-leaf - 58 Sweet Gale - 59 Sphagnum Moss - 60
SWAMP	**BOG**
American Elm Hemlock	Bog-cotton Laurel Orchids Pitcher Plant Sundew

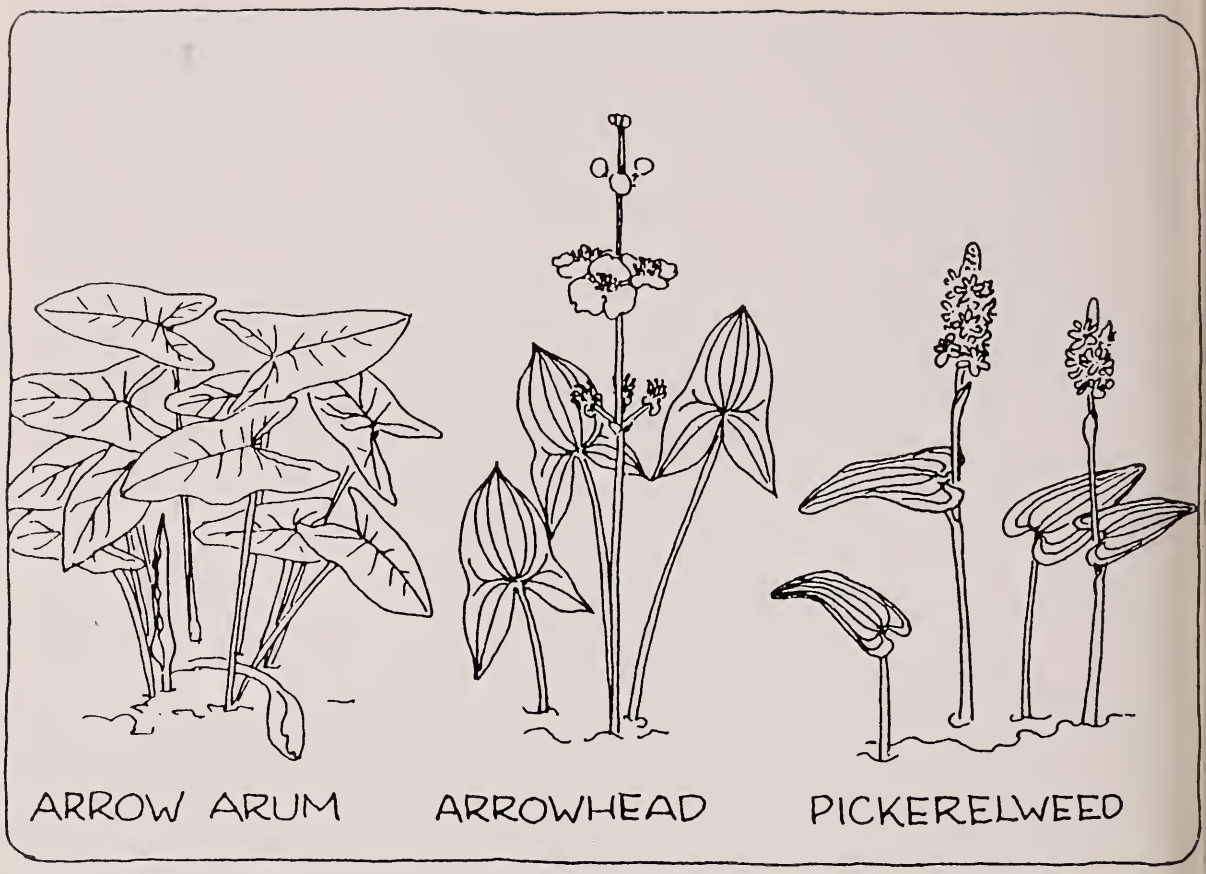
MARSH: A wetland dominated by herbaceous or non-woody vegetation. Examples would be Cattail marshes, Arrow-arum marshes, etc. The water level ranges from 3 feet to 6 inches or less with surface water present year-round or absent during the late summer and abnormally dry periods. The substrate (or soil) is most often muck.

MARSH PLANTS: There are three common and easily confused marsh plants with arrow-shaped leaves: Arrow-arum, Arrowhead, and Pickerelweed.

ARROW-ARUM or TUCKAHOE
Peltandra virginica

Habitat: Common in shallow water and mucky soils across the Commonwealth, except in Barnstable, Dukes, and Nantucket Counties. It often covers acres of marshland.

Comment: Seeds and roots are excellent wildlife food. Waterfowl and songbirds use the thick growth for cover and nesting.



ARROWHEAD or WAPATO
Sagittaria latifolia

Habitat: Same as Arrow-arum.

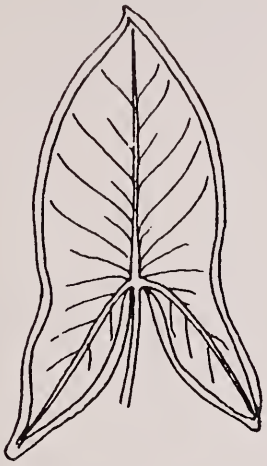
Comment: Desirable food for wildlife and people. The tubers can be raked out of the muck in fall and eaten. They taste like small flavorful potatoes.

IMPORTANT: This species is not on the list of inland wetland plants in the Massachusetts laws, but it is a characteristic wetland plant and should be added to the law as soon as possible.

PICKERELWEED
Pontederia cordata

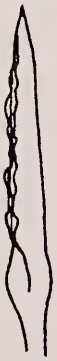
Habitat: Some as Arrow-arum and Arrowhead.

Comment: Often forms large colonies and can dominate marshes, shallow ponds, and slow-moving brooks. The young leaves are grazed by Canada geese. Roots and seeds are eaten by other wildlife, and the dense green leaves provide protective cover.



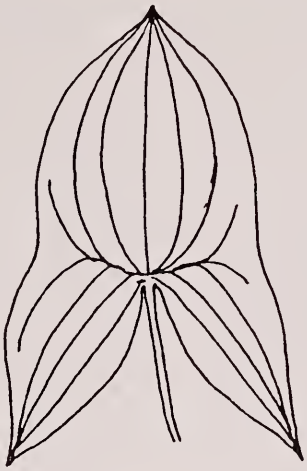
Arrow-arum

Large, 7-inch or more fleshy leaves with upside-down Y formed by the main veins. Veins terminate before edges of leaf, leaving a distinct margin.



Inconspicuous flowers hidden inside a green leaf-like structure from May to July.

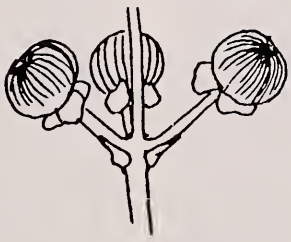
Bulb-shaped fruit with berries borne on curving stalk from September to October.



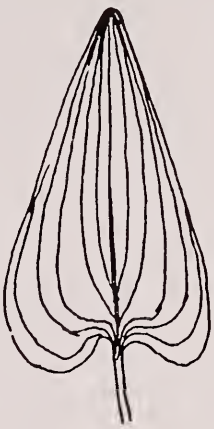
Arrowhead

Leaf lobes pointed; parallel veins run all the way out to tip of each lobe.

3-petal white flowers in whorls of three, July to September.



Round fruit in clusters of three from September to October.



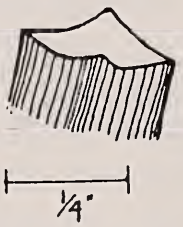
Pickerelweed

Leaf usually inverted heart-shape in this region; outer veins following curve of leaf.

Very noticeable purple flowers on spikes from June to September.

Fruits consist of a single seed, about the size of a kernel of corn but with very wrinkled edges.

DESCRIPTIONS OF THE THREE SPECIES



BUR-REED
Sparganium spp.

Description: The 3-foot leaves are similar to iris leaves but often have a thickened ridge running up the back of the leaf almost to the tip. The flowers form small ball-like clusters on zigzag stems and bloom from June to August. Soon afterward the round 1- to 1½-inch spiny fruits appear.

Habitat: Shallow water of marshes. It does not need wet mucky soil. It has been found in standing water of abandoned gravel pits.

CATTAIL

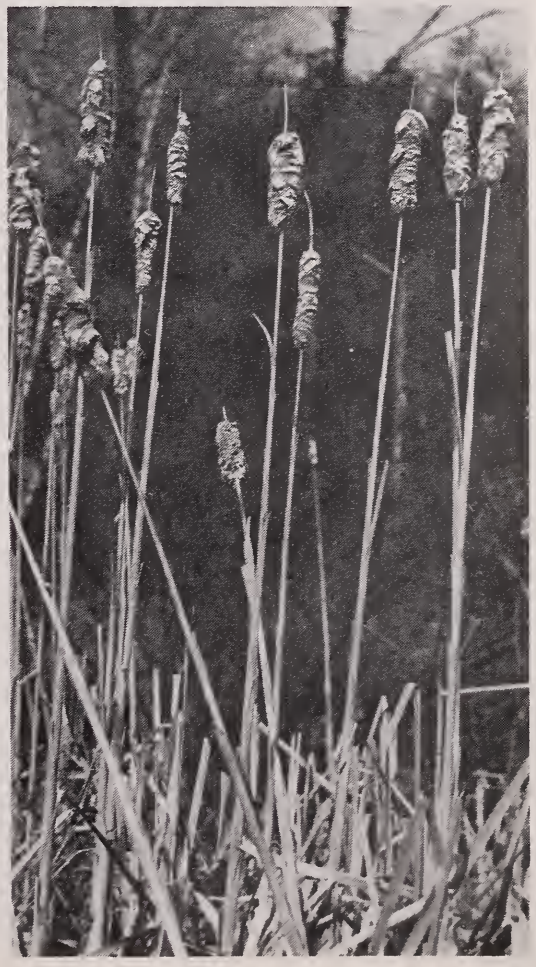
Typha latifolia [*Wide-leaved*],
T. angustifolia [*Narrow-leaved*]

Description: Hardly needs description, but....A tall plant, 3 to 8 feet, with long, flat leaves and densely packed flowers at the top of the stalk. The flowers, which first appear as a pair of linked green "sausages," turn brown, and the top "sausage" (male flowers) disintegrates. The lower fruit head (from female flowers) can last into next year.

Habitat: Brackish water, inland shallow water, and mucky soils.

Comment: The starchy roots and young shoots are delectable wildlife staples. The colonial growth habit provides high quality waterfowl cover and nesting sites.

Above - In flower
Left - In summer
Below - In winter



WATER-WILLOW or SWAMP LOOSESTRIFE
Decodon verticillatus
Description: A semi-shrubby plant characterized by arching branches which root at the tips and send up another arching shoot in a leapfrog manner. The leaves are arranged on the stem in pairs or in whorls of 3. From July to August the purple-pink flowers form clusters all along the stems.
Habitat: Standing shallow water of marshes, swamp edges, bogs, banks of ponds, and slow-moving streams and rivers.
Comment: The arching branch pattern is one of the best havens for waterfowl, especially wood ducks.

BUTTONBUSH
Cephalanthus occidentalis

Description: A rather scraggly shrub with 3- to 6-inch leaves on short stems and in pairs or in whorls of 3 or 4. The white flowers form densely packed ball-like heads up to 2 inches in diameter from July to August. The white petals soon fall, leaving round fruits. These "buttons" turn brown and remain into winter.

Habitat: Often in year-round standing water of marshes, edges of ponds, and streams with mucky soil.

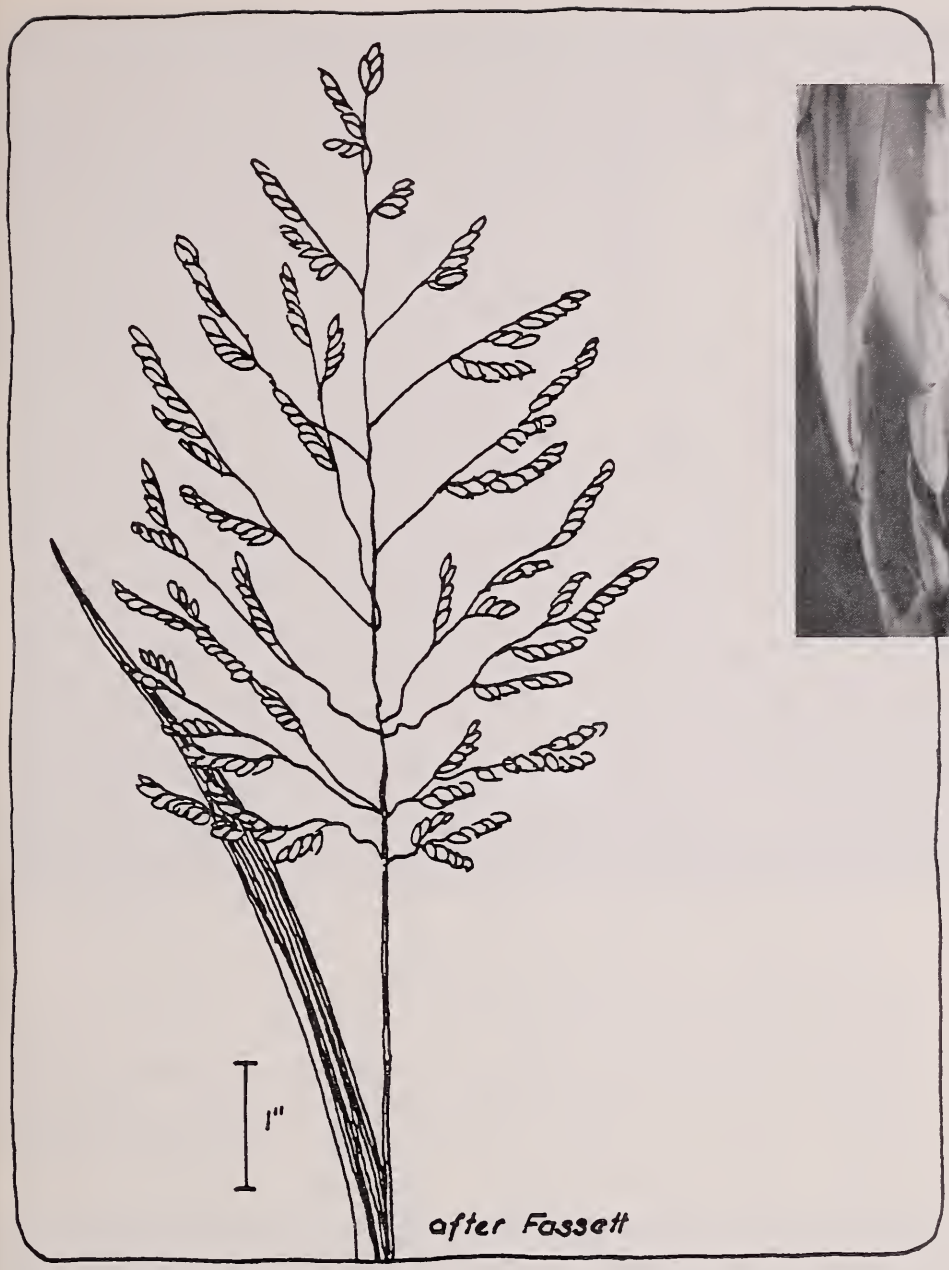
Comment: Butterflies are attracted to the flowers. Waterfowl eat the seeds.

REED-CANARY-GRASS
Phalaris arundinacea

Description: A rather handsome grass, 3- to 6-feet tall with broad (¾ inch), long (6 inch) leaf blades. The soft yellow-brown color to which the whole plant turns in fall lasts into winter. The flowering head is about 6 inches long by ¾ inches in diameter.

Habitat: Virtually outlines floodplains along many rivers and streams in eastern Massachusetts.

Comment: This was an important meadow hay in colonial times.



RICE CUTGRASS
Leersia oryzoides

Description: Walk through Rice Cutgrass and you will feel the almost invisible teeth on the edges of the leaves. This harsh introduction belies the soft, fragile appearance of this lime-green species which only reaches 3 feet in height. The mature fruits in June to October are similar to those of rice.

Habitat: Marshes and muddy soil along the edges of ponds and streams.

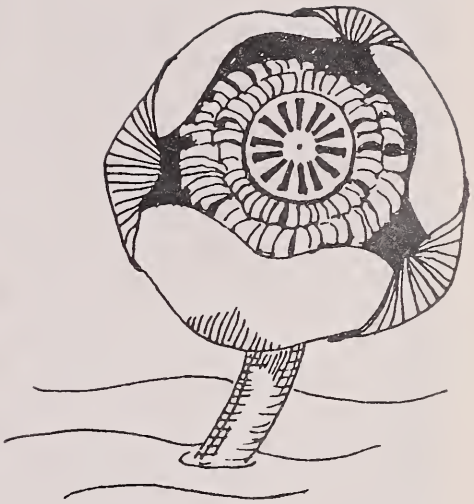
WATER-LILY or POND-LILY
Nymphaea odorata

Description: An easy plant to recognize because of its large, round (2 to 10 inches in diameter), floating leaves. They are purple on the underside. The flowers, which bloom from June to September, are 3 to 5 inches wide with many white petals.

Habitat: Open waters of bogs, ponds, and still waters of rivers and streams.

Comment: This plant is so commonly known that it is almost an insult to list it. Yet it is useful in spotting wetlands from a distance. The leaves need not be floating; when the water level drops, they do nicely on the muck surface.

Seed pod



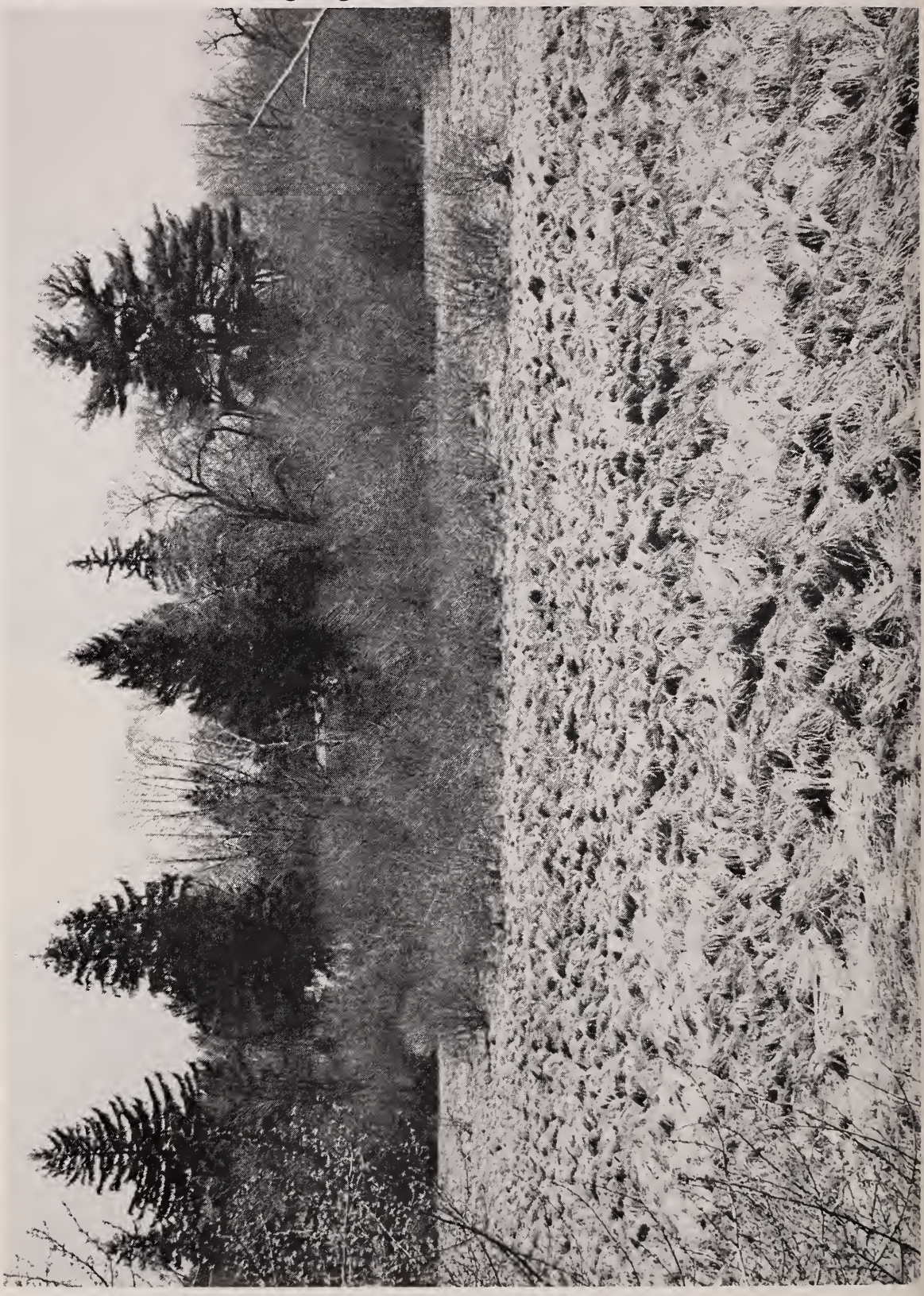
YELLOW POND-LILY or SPATTERDOCK
Nuphar variegatum

Description: It looks like a yellow "water-lily" but has oblong leaves, usually floating. The flowers only have 5 or 6 sepals which look like petals.

Habitat: Open waters of bogs, ponds, and still waters of rivers and streams.

Comments: Like Water-lily, this plant can be seen from a distance.

WET MEADOW, in spring



Above - Wet meadow in fall
Left - Wet meadow in early spring.

WET MEADOWS: A kind of marsh, characterized by the dominance of grasses or sedges. Meadows often are, or have been, used agriculturally for hay or livestock grazing sites. Thus, many meadows are developed and maintained artificially. The water level ranges from 6 inches or less with surface water mostly not visible during the year. However, the water level remains at or very near the surface (within a few inches).

WET MEADOW, grazed, in spring

Below - Wet meadow in fall. Note brouse line from grazing animals. The meadow looks dry.
Left - Same grazed wet meadow in spring.
Above - Same meadow in a wet fall.

TUSSOCK SEDGE
Carex stricta

Description: This plant grows in clumps or tussocks with leaves arching outward. Look for, or better yet, feel the triangular stem. This characteristic of sedges (''sedges have edges'') is usually best felt near the base of the stem.

Habitat: Often dominates wet meadows; sometimes found in marshes, swamp edges, and bogs.

Comment: Numerous sedges are found in wetlands. They do not all form hummocks or clumps, but those species that do make great stepping stones across the water or muck.

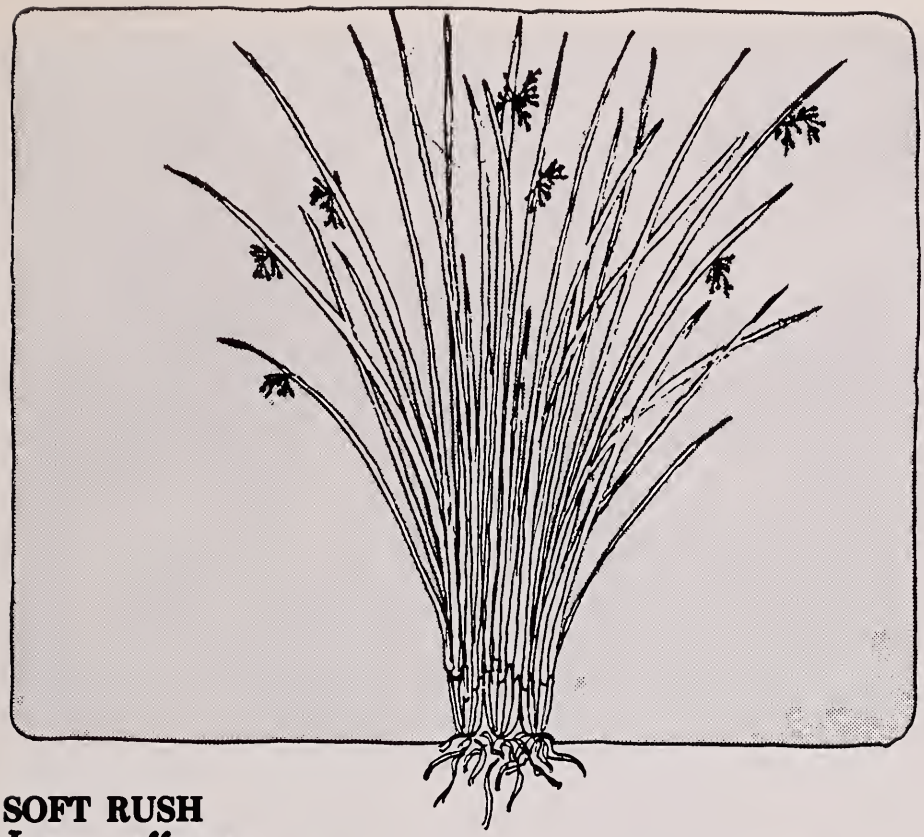
WOOL-GRASS
Scirpus cyperinus

Description: Contrary to its common name, this is not a "grass." It is a bulrush. Its 3- to 5-foot stems are topped with a very loose and dangly cluster of non-descript flowers which become distinctly woolly brown fruits in September and October.

Habitat: Wet meadows, wet soils around ponds, rivers, and swamp edges. This plant can form rather dense stands.

Comment: Fine cover for migrating waterfowl and songbirds.

UMBRELLA-SEDGE
Cyperus strigosus
Description: This medium-sized (to 3 feet) sedge is unique in that it has a cluster of yellow-green leaves gathered at the top of the plant just below the bristly looking fruits. Except for the fruiting period during September and October, this plant hardly is noticed.
Habitat: Wet meadows, wet soils around ponds, rivers, and swamp edges.
Comment: Recall that "sedges have edges" and sure enough the stem is triangular. Roll a stem between the thumb and forefinger to test.



SOFT RUSH
Juncus effusus

Description: This is often mistaken for a grass, but unlike grasses it has no flat leaf blades and no solid joints in its stem. The long, round, hollow stems taper to a point, and the plant grows in a clump. The flowers and fruits are borne directly out of the side of the stem just below the tip.

Habitat: Sunny open areas, standing water or mucky soil of meadows, marshes, and swamp edges.

BLUE FLAG [Iris]
Iris versicolor
Description: This plant resembles the Siberian Iris, a common garden variety. Blue Flag flowers from May to July.
Habitat: Usually in partially shaded to openly sunny areas of wet meadows, marshes, and swamp edges.

REED or PHRAGMITES
Phragmites communis

Description: When you find yourself in a thick stand of extremely tall grass (up to 12 feet), you undoubtedly have located Reed. By late summer, the large shiny purplish plumes of flowers top the stems. The whole plant turns a light brown and is distinctive through winter.

Habitat: Open waters of wetlands; found mostly near the coast. Pure stands may cover many acres.

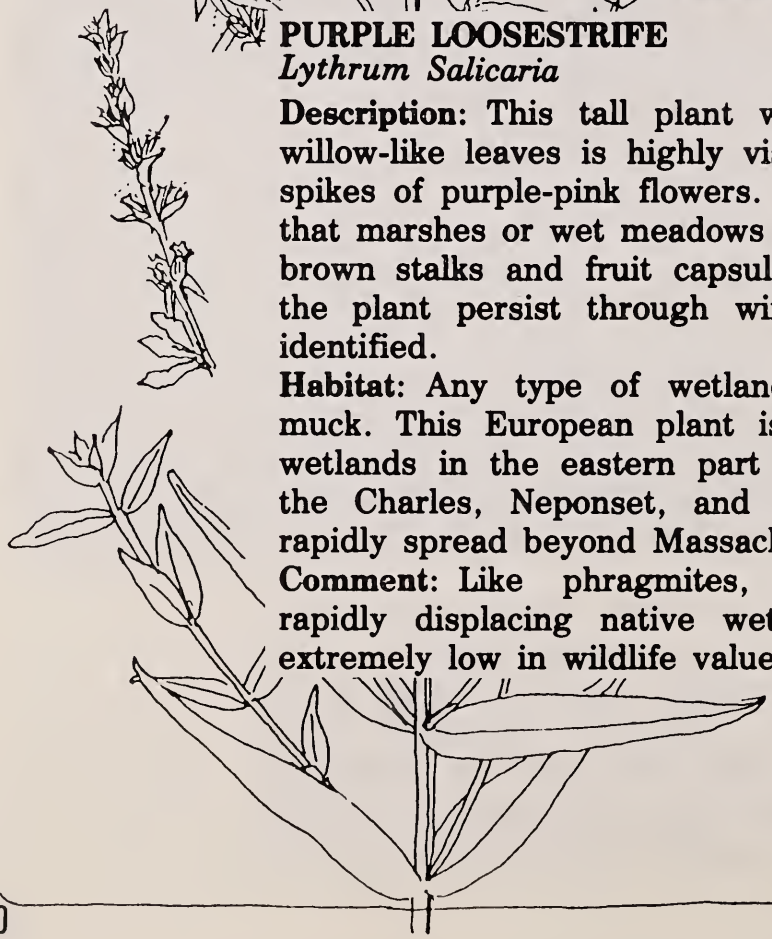
Comment: This plant deserves special note as it is highly aggressive and adaptive. Originally from Europe, it will appear more and more frequently in Massachusetts wetlands--to the detriment of native species.

PURPLE LOOSESTRIFE
Lythrum Salicaria

Description: This tall plant with pairs or whorls of willow-like leaves is highly visible in August with its spikes of purple-pink flowers. It is often so numerous that marshes or wet meadows look magenta. The dead brown stalks and fruit capsules all along the tips of the plant persist through winter and can easily be identified.

Habitat: Any type of wetland, particularly in open muck. This European plant is dominating freshwater wetlands in the eastern part of Massachusetts along the Charles, Neponset, and Mystic Rivers and has rapidly spread beyond Massachusetts.

Comment: Like phragmites, Purple Loosestrife is rapidly displacing native wetland vegetation and is extremely low in wildlife value.



SENSITIVE FERN
Onoclea sensibilis

Description: This fern has two types of leaves or fronds. The green vegetative frond grows to 2 feet with a continuous leaf blade. (It is not divided into leaflets as in other ferns.) The reproductive frond has no leaf at all; it is nothing more than a stalk topped with "beads" which open and persist into the next year.

Habitat: Wet soils of marshes and in partially shaded swamps, bogs, or wet meadows.

Comment: The vegetative frond dies with the first frost--hence, the common name "sensitive" fern.

SHRUB SWAMP

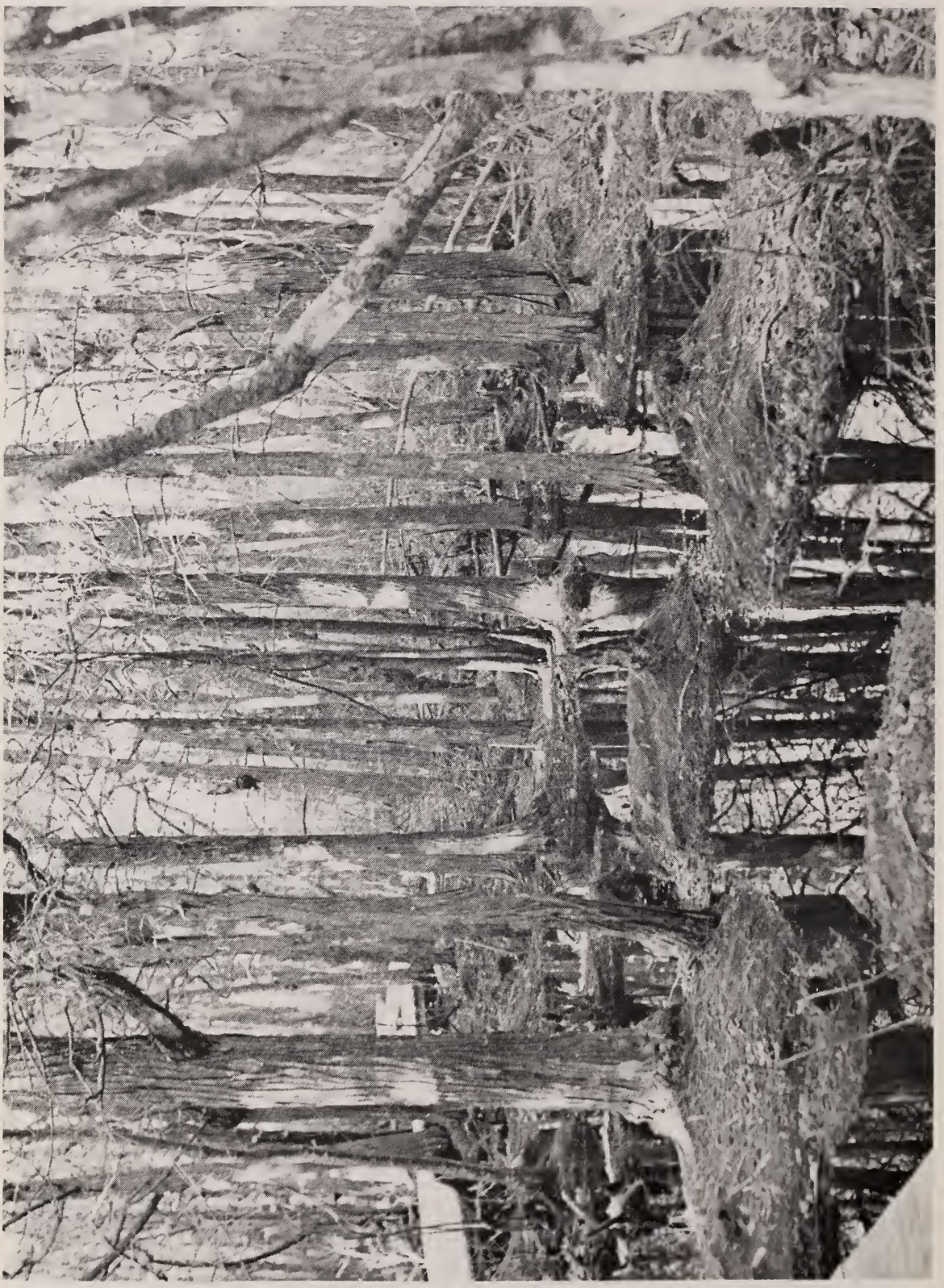
Above - Marsh succeeding to shrub swamp in winter.
Left - Marsh succeeding to shrub swamp.

SWAMP: A wetland dominated by woody vegetation. There are tree swamps such as Red Maple swamps, Atlantic White Cedar swamps, etc. and shrub swamps such as a Blueberry swamp, Alder swamp, etc. The water level ranges from seasonally flooded to a depth of 1 foot to no surface water during the late summer and normally dry periods. The substrate (or soil type) is often shallow, firm muck underlaid by a firmer substrate like gravelly sands.

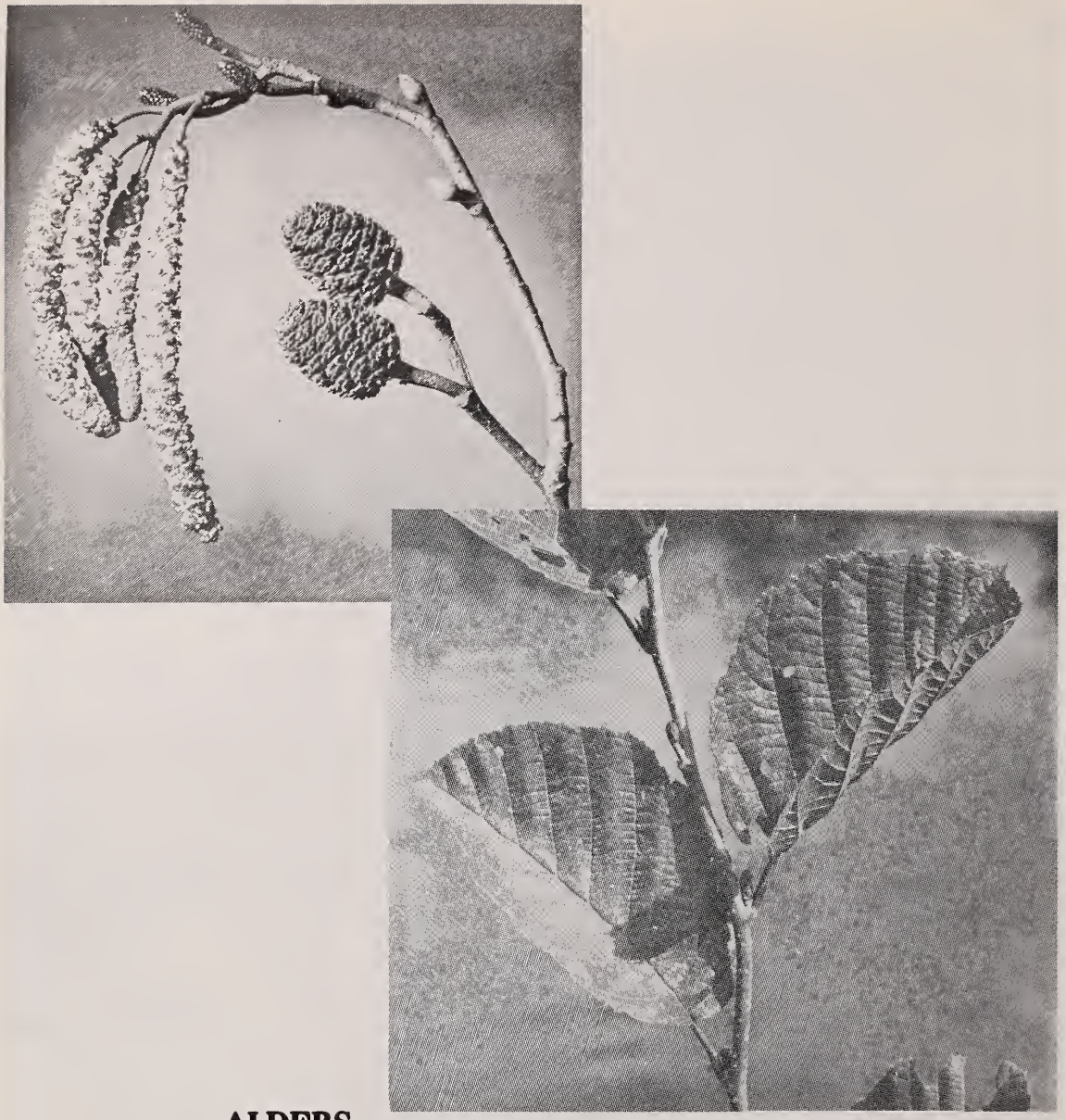
TREE SWAMP

Above - Tree swamp in early spring
Left - Tree swamp in fall

ATLANTIC WHITE CEDAR SWAMP



Above - Crown of Atlantic White Cedar tree.
Left - Atlantic White Cedar Swamp.



ALDERS

***Alnus rugosa* [*Speckled Alder*],**
***Alnus serrulata* [*Smooth or Common Alder*]**

Description: These tall shrubs (to 15 feet) have branches with cone-like fruits about ½-inch long that persist year-round. The bark is distinguished by horizontal white lines called "lenticels." Winter buds are located uniquely on short stalks. In March or April the 4-inch long finger-thick brown flower clusters (called "catkins") droop from the twig ends.

Habitat: Found primarily in wet meadow or marsh edges or forming their own swamp.

Comment: A notorious invader of neglected wet agricultural fields.

♂ ♀ MALE AND FEMALE FLOWERS ON SEPARATE PLANTS

About life Size

WINTERBERRY; BLACK-ALDER
Ilex verticillata

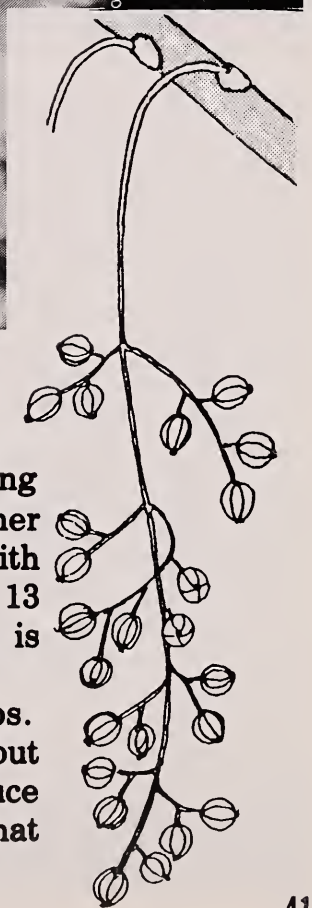
Description: This common shrub hardly is noticed until October through January when the twigs of the female plants become covered with bright red fruits about the size of small blueberries. The tiny white flowers of July are quite fragrant. With the first frosts of fall, the leaves turn black and immediately drop.
Habitat: Swamps and along stream and marsh edges. Fruits especially well in partial shade to full sun.
Comment: This plant is not an Alder but one of our native hollies. Songbirds eat the fruit in winter.

HIGHBUSH-BLUEBERRY
Vaccinium corymbosum

Description: Who doesn't know blueberries; if not on the shrub, at least in the dish? Growing to 10 feet, the bark on older branches is usually light gray and rather flaky. In spring the buds are bright red. June to July brings clusters of pendular white, urn-shaped flowers. The berries follow from July to August. In fall the foliage turns from a flaming to a dark maroonish red, especially in sunny sites. The twigs of the current year's growth are brightly colored from shades of green to red through winter.

Habitat: Found in many places--swamps, under trees such as Red Maples or alone in their own blueberry swamps, along riverbanks, ponds, streams, and in bogs. It also is able to do well in upland sites.

Comment: It is amazing how few people recognize this plant unless it is in fruit. Wildlife enjoy the fruit as much as people.

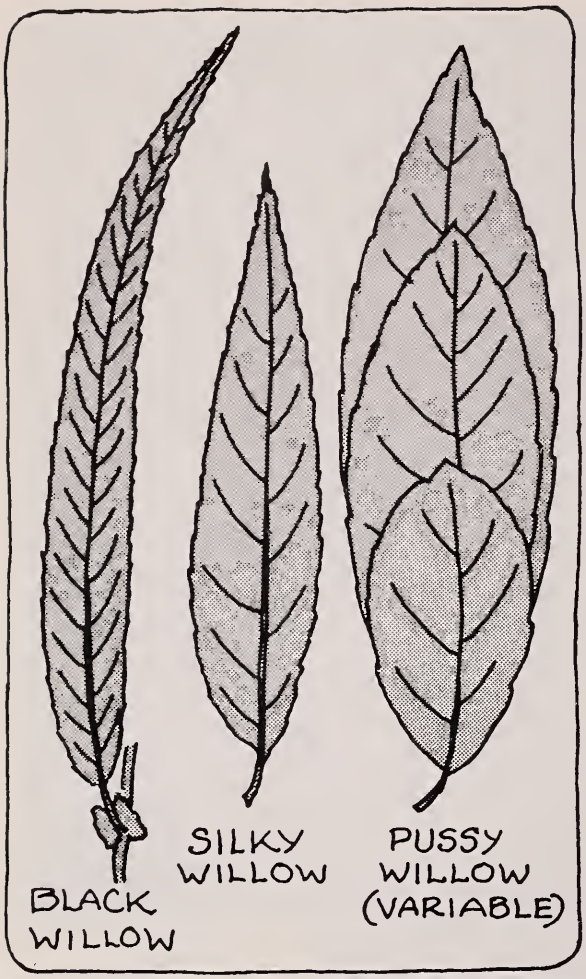


POISON SUMAC
Rhus vernix

Description: Ivory-colored berries on long drooping stalks in fall and winter are most distinctive. At other seasons, watch for a small tree or large shrub with upwardly ascending compound leaves with 7 to 13 smooth-edged leaflets. The brilliant flaming foliage is dangerously tempting.

Habitat: This species is virtually restricted to swamps.

Comments: DO NOT HANDLE THIS PLANT without protection. Virulent oils from every part of it produce a severe skin rash, often more intense than that caused by its close relative Poison Ivy.



WILLOWS
Salix discolor [*Pussy Willow*]
Salix nigra [*Black Willow*]
Description: The first willow is a shrub, the second a tree. All willows have pussy willow-type flowers. In March and April the Pussy Willow flowers are well know for appearing before the leaves emerge. Willow buds provide a good identifying character in non-leafy periods, for they all have only one scale over the entire bud and it is very glossy.
Habitat: Any sunny section of a wetland. Shrub willows can form their own swamp. Black Willows are characteristic trees of floodplain forests, such as those along the Connecticut River.

SWEET PEPPERBUSH
Clethra alnifolia

Description: This 4- to 8-foot shrub is easy to identify year-round for its dried fruit capsules, looking like peppercorns, invariably can be found on the ends of twigs. During July and August the mature flowers form erect 4-inch long white clusters on the twig ends and give off a strong sweet fragrance.

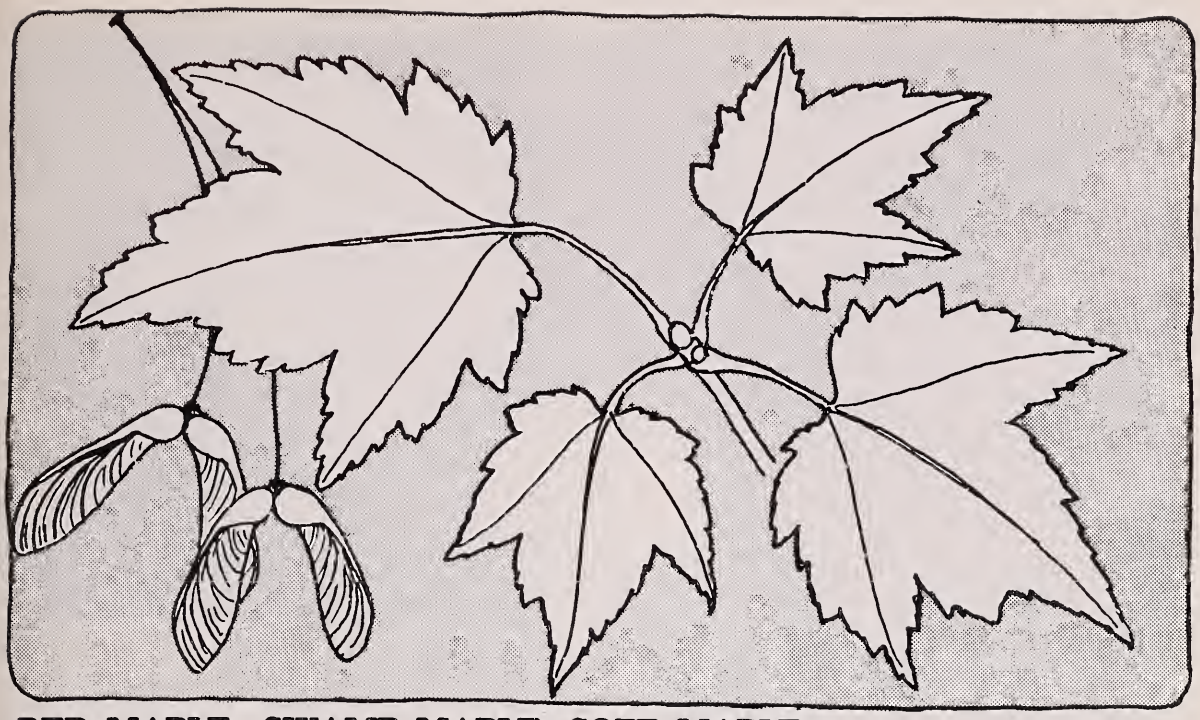
Habitat: Swamps, pond edges, stream beds. It also can grow on uplands but usually is restricted to where soil drainage is poor for at least part of the year.

BLACK ASH
Fraxinus nigra

Description: This member of the Olive family has distinctive compound leaves in pairs on the twigs. These twigs also are in pairs, virtually at right angles from the branches. The fruits of June to September are readily recognizable by their wings which often persist on the tree through the winter.

Habitat: River floodplains and other moist lowlands.

Comment: This ash is difficult to distinguish from other ashes--but it is the one which grows in wet soils.



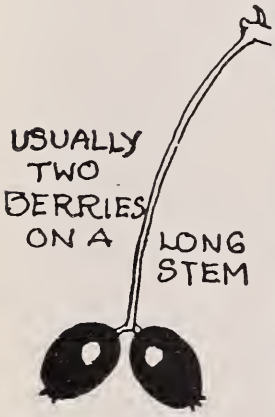
RED MAPLE; SWAMP MAPLE; SOFT MAPLE
Acer rubrum

Description: This plant can appear shrubby when young or grow to a very large tree. From June to October the paired leaves have 3 to 5 main lobes, each edged with tiny teeth. Note the sharp V at the junction of the main lobes. (Silver Maple, another species found in floodplains and wet soils, has U-shaped lobe junctions.) The flowers are red and, like all maples, appear in April to May before the leaves emerge. Immediately after the flowers, the fruits form in dangling clusters. Note the small angle at the joint of the winged seeds. (Silver Maple seed joints are much wider.) In early fall its yellow and red colors stand out among the brilliant foliage. Without the leaves, identification is more difficult. The bark on young trees is smooth and gray. On older trees the trunk can be very rough with the smooth gray bark confined to the upper limbs. The buds are red throughout the winter, giving any Red Maple swamp a reddish tinge when seen from a distance. This coloring intensifies during the brief flowering period. The current year's growth is also red during winter.

Habitat: Red Maple is a highly adaptable tree. It dominates swamps throughout the Commonwealth, but it also does quite well in upland conditions.

Comment: RED MAPLE IS THE SINGLE MOST COMMON TREE SPECIES GROWING IN SWAMPS IN MASSACHUSETTS.

TUPELO; BLACK GUM; SOUR GUM; BEETLEBUNG [on the Cape and Islands]
Nyssa sylvatica



Description: In Massachusetts the Tupelo is usually a medium-sized tree with light gray, deeply grooved, checkered bark. The trunk and especially the main branches look distinctly twisted or contorted. The lower branches droop. The leaves are shiny and leathery and turn a deep scarlet very early, usually in late summer. Small paired green fruits also appear in late summer on long stalks; this fruit turns dark blue before dropping.

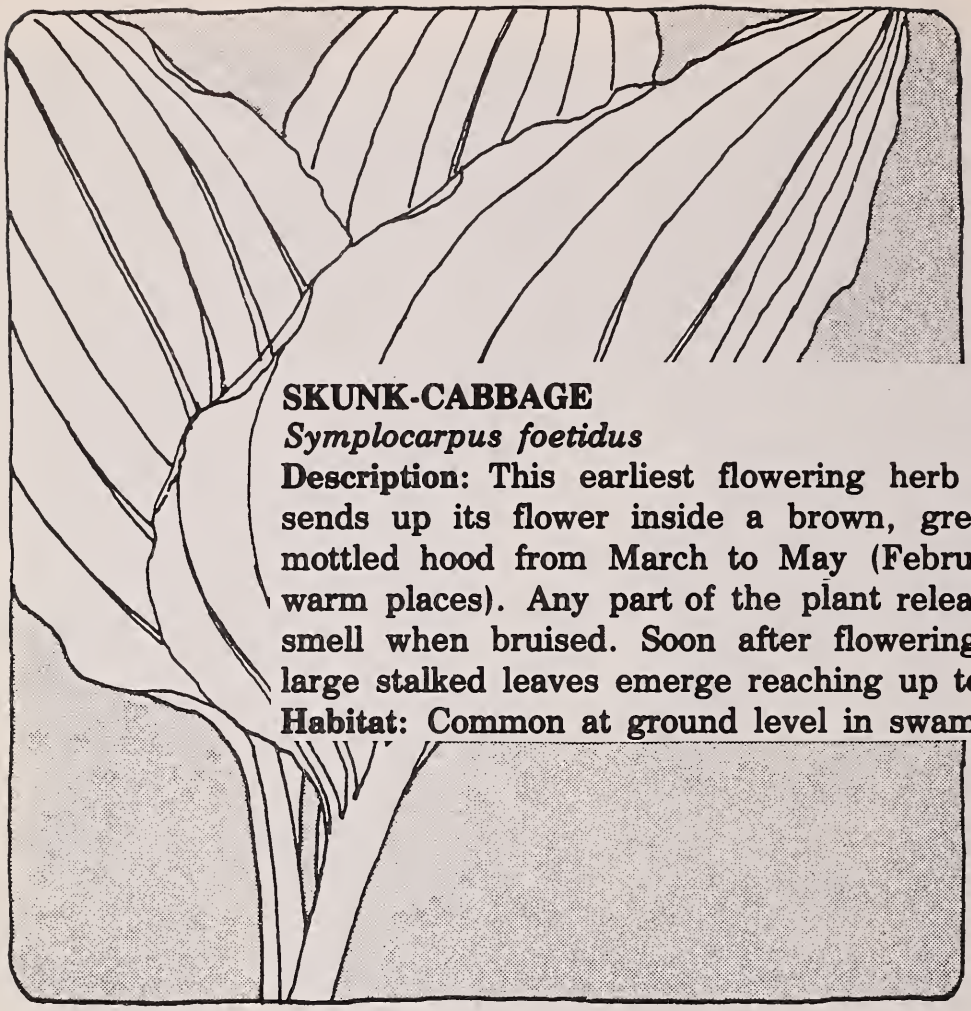
Habitat: Swamps and along river and pond edges. This tree also can grow in dry upland sites but not usually in groves as it does in wetlands.

ATLANTIC WHITE CEDAR or SWAMP CEDAR
Chamaecyparis thyoides

Description: This evergreen tree has tiny scale-like leaves which overlap one another like fish scales. The bark is light reddish-brown and tends to peel in vertical strips. Three pairs of crumpled scales make up the small ¼-inch cones.

Habitat: This is the important evergreen species of swamps and bogs in eastern Massachusets from Worcester County to Cape Cod, and north into the Connecticut Valley up to the Holyoke Range in Amherst.

Comment: A very valuable lumber species.



SKUNK-CABBAGE
Symplocarpus foetidus
Description: This earliest flowering herb of the year sends up its flower inside a brown, green, and red mottled hood from March to May (February in some warm places). Any part of the plant releases a strong smell when bruised. Soon after flowering clusters of large stalked leaves emerge reaching up to 3 feet.
Habitat: Common at ground level in swamps.

FALSE HELLEBORE or INDIAN POKE
Veratrum viride

Description: This plant is known for the folded, pleated pattern of its early spring leaves and its impressive size--from 3 to 7 feet. When it flowers, it is topped with a large cluster of small yellow-green blossoms.
Habitat: Wet woods and swamps.
Comment: Poisonous!

Note round buds.

MARSH-MARIGOLD or COWSLIP
Caltha palustris

Description: Early in spring, just before the leaves emerge on the trees, Marsh-marigold's bright clusters of yellow flowers stand out vividly against the dark swamp soils. The leaves are dark green, rounded, and often kidney-shaped. They grow on thick stems.
Habitat: Swamps, brooksides, and wet meadows.
Comment: Some people eat this plant, but boil it first to remove the toxins. The raw greens are poisonous.

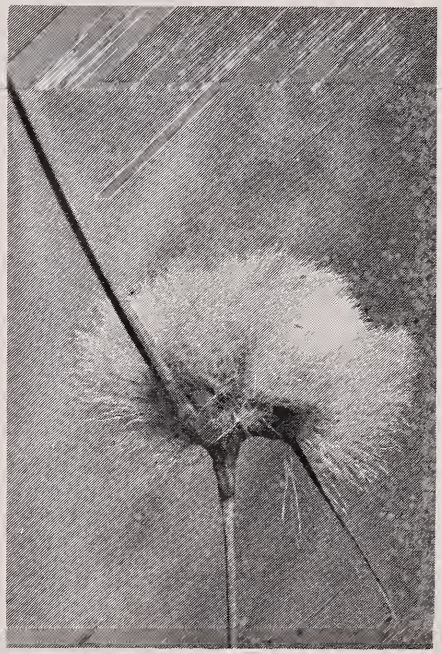
SPICEBUSH
Lindera Benzoin

Description: In March to April the small yellow flowers are so numerous along the twigs that the entire plant stands out under the taller swamp trees. Spicebush grows to about 12 feet with wide, spreading branches. The brilliant shiny red fruits in late fall are elongated berries. The twigs when broken at any time of the year emit a fragrant aroma.

Habitat: Swamps, wet woods, and along streams.

Comment: Tincture of benzoin used to be extracted from this plant. It is a good firestarter since its volatile aromatic chemicals make even green wood burn.

BOG: A wetland characterized by a sphagnum moss (peat moss) substrate, vegetation dominated by shrubs of the Heath or Blueberry Family and by Atlantic White Cedar in coastal bogs or Black Spruce and Tamarack in northern Worcester County to Berkshire bogs. There are usually areas of open water and areas where the bog mat is floating. The water level is well above the surface in spring but just below the surface during the rest of the year. The substrate is 100 percent organic matter (peat or decayed material); thus, there are virtually no minerals such as gravel or sand present.



Left - Bog vegetation forms around open water. Black Spruce in the background.
Above - Note shrubby areas in the background and Cotton-grass, a sedge of bogs and wet meadows, spotted through the foreground.
Right - Cotton-grass.

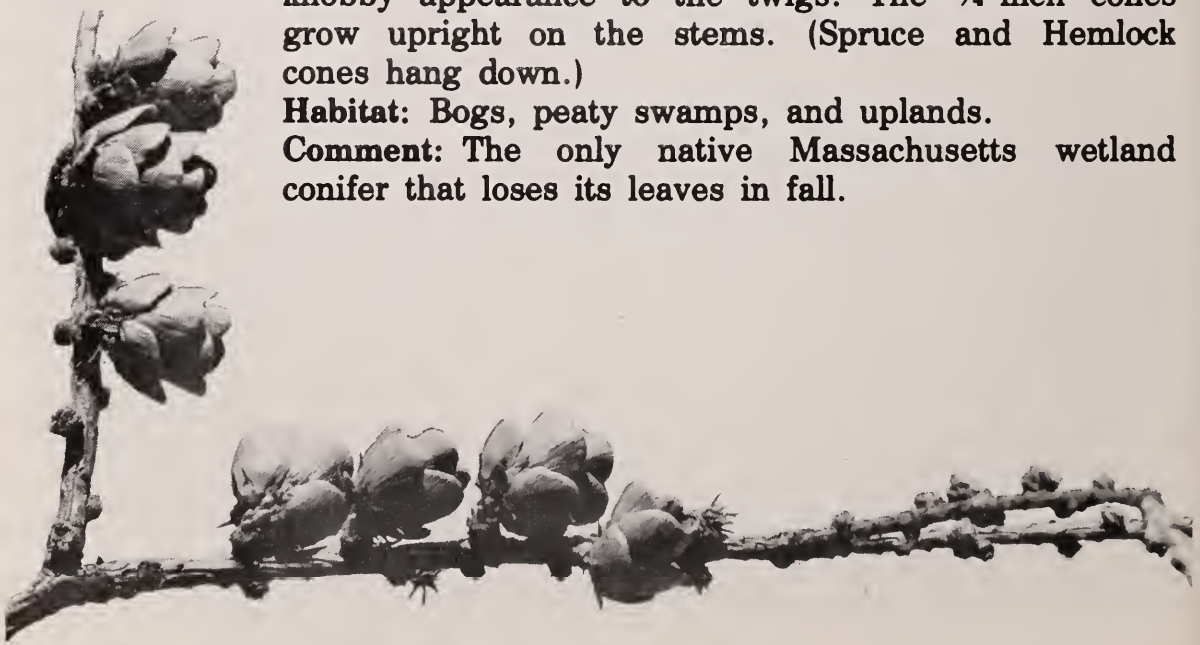
In Summer

LARCH: TAMARACK: HACKMATACK
Larix laricina

Description: This medium-sized tree (to 50 feet) has needles in bunches of 9 or more growing from short spurs (shortened branches about ¼-inch long) along the twigs. The needles turn yellow in fall and then drop. The spurs show up then, giving a distinctly knobby appearance to the twigs. The ¾-inch cones grow upright on the stems. (Spruce and Hemlock cones hang down.)

Habitat: Bogs, peaty swamps, and uplands.

Comment: The only native Massachusetts wetland conifer that loses its leaves in fall.



In winter

BLACK SPRUCE
or BOG SPRUCE
Picea mariana

Description: Another medium-sized tree (to 40 feet) with dense and distinctively blunt-ended needles growing out around the stems. The needles are very short--¼- to ¾-inch long. Cones are quite numerous, about 1 inch long, and some always remain on the twigs even after the limb has died. (Hemlocks and other Spruces drop their cones after the seeds are dispersed).

Habitat: This is not a dominant bog tree in Massachusetts as it is largely restricted to bog edges in the Berkshires and extends only into northern Worcester County.

Seed pod

SWAMP AZALEA or CLAMMY AZALEA
Rhododendron viscosum

Description: This 8-foot shrub has twigs growing in characteristic whorls. The white 1½-inch trumpet-shaped flowers of summer exude a heavy cinnamony fragrance and a sticky substance. The flower literally sticks to the fingers when squeezed. The dried brown fruit capsules remain during winter looking like dried brown flowers themselves.

Habitat: Bog, wet woods, swamps, shores of ponds in both sun and shade.

CRANBERRY
Vaccinium Oxycoccos
Vaccinium macrocarpon

Description: While they may not look it, these are small shrubs which creep along the ground rather than grow erect. The dark green evergreen leaves are only about ½-inch long. The flowers on upright stems have their day in June to July, showing pink, sharply curving petals. The well known fruits are bright red ½-inch berries which mature from October to November.

Habitat: Open bogs and wet acid sand such as in gravel pits.

Comment: Bearberry, an upland plant on Cape Cod and the Islands, looks very much like Cranberry. However, Bearberry does not tolerate wet conditions.

LEATHER-LEAF
Chamaedaphne calyculata

Description: A low shrub, 2 to 3 feet tall, which forms extensive thick stands. Some green leaves persist through winter making the plant semi-evergreen. The leaves typically become smaller towards the tips of the arching branches. The flowers hang from the lower side of the twigs like a string of bells in April to June.

Habitat: Open bogs and sometimes along pond, swamp, and marsh edges.

SWEET GALE
Myrica gale

Description: A shrub from 4 to 7 feet tall, it has aromatic leaves which also are shaped uniquely--they get wider from the base to the tip. The outer leaf edge is toothed.

Habitat: Forms thick patches in the acid sandy soils around Cape ponds and along boggy shores and swamps across the Commonwealth.

Comment: Its brilliant green color is evidence of its ability to fix nitrogen in otherwise low nitrate wetland soils. The aromatic leaves and broken twigs indicate that it is a close relative of the Bayberry and Sweet Fern.

Above - Dryish sphagnum moss and red maple leaf.

SPHAGNUM MOSS or PEAT MOSS
Sphagnum spp.

Description: This usually lime-green moss (sometimes it has a reddish-rust tint) forms thick spongy mats out of which other plants often grow. Identification is easy. Squeeze a handful of the moss in question and if it is Sphagnum, it will wring out water. This is a highly absorbent plant.

Habitat: Grows in deep shade to full sun. Once established, it grows upon itself and over rocks, soil, or water.

Comment: A floating mat of Sphagnum may not support the trespasser. Beware!

WHERE TO GET HELP FROM EXPERTS

These are organizations you can call. You may also send them dried and pressed samples of the plant you want identified.

Concord Field Station, Harvard University, Bedford, MA 01730 (275-1725) (Herbarium open Tuesdays, 10 a.m. to 2 p.m.)

Habitat, 10 Juniper Road, Belmont, MA 02176 (489-3850)

Harvard Herbarium, Harvard University, Cambridge, MA 02138 (495-2365)

Herbarium, University of Massachusetts, Amherst, MA 01002 (323-6647)

New England Wild Flower Society, Hemenway Road, Framingham, MA 01701 (877-6574; 237-4924)

Waltham Field Station, University of Massachusetts, 241 Beaver Street, Waltham, MA 02154 (891-0650)

Natural History Services, Massachusetts Audubon Society, Lincoln, MA 0177 (259-9500)

For further information on wetlands:

Conservation Law Foundation, 3 Joy Street, Boston, MA 02108 (742-2540)

Massachusetts Association of Conservation Commissions, Tufts University, Lincoln Filene Center - Room 310, Medford, MA 02155 (628-5000 ext. 353)

ANNOTATED REFERENCES

Inland Wetland Plants of Connecticut, Connecticut Arboretum, Bulletin No. 19, Connecticut College, New London, CT 06320, 1973. An illustrated guide to plants by habitat--marshes, swamps, bogs, and floodplains. Also contains an excellent text on types of wetlands and their ecological role for flood control, water supply, pollution filtration, etc.

A Field Guide to the Wildflowers, Roger Tory Peterson and Margaret McKenny, 1968; **A Field Guide to the Trees and Shrubs,** George A. Petrides, 1958. Both field guides from Houghton Mifflin Co., Boston, MA. The wildflower guide is superbly illustrated and has brief, accurate references to habitats. It covers only non-woody species.

The tree and shrub guide has mediocre illustrations, but the text for each species describes habitats, wildlife values, and "similar species" to help undo confusion.

A Manual of Aquatic Plants, Norman C. Fassett, University of Wisconsin Press, 1957. Superior drawings. Includes some rushes, sedges, and grasses. This book plus the three preceding would give the beginner an excellent start on a reference library.

Common Marsh, Underwater and Floating-leaved Plants of the United States and Canada, Neil Hotchkiss, Dover Publications, Inc., New York, 1972. Less expensive than the above. Covers much of the same material, simpler for the beginner. On the whole, useful drawings.

The New Britton and Brown Illustrated Flora, Henry A. Gleason, Hafner Press, New York, 1952. A three-

volume reference, quite usable by the layman. Species descriptions are necessarily somewhat technical, but the real value is that virtually all species are excellently illustrated. The drawback is the high cost, so try the local library.

Newcomb's Wildflower Guide, Lawrence Newcomb, Little, Brown and Company, 1977. This is the newest identification book for both laypeople and experts. Each species is accurately illustrated, habitats are noted, and it covers both herbs and shrubs.

Aquatic Plants of the United States, Walter C. Muenscher, Cornell University Press, Ithaca, NY, 1944. The detailed illustrations are the valuable part here, otherwise it is a technical manual and limited to non-woody species. It has range maps and keys for identification.

Gray's Manual of Botany, Merritt Lyndon Fernald, American Book Co., Boston, MA 1950. A technical reference, yet widely referred to as the ultimate resource for correct identifications.

OTHER SPECIALIZED BOOKS

Manual of the Grasses of the United States, two volumes, A.S. Hitchcock, Dover Publications, Inc., New York, 1971.

The Shrub Identification Book, George W.D. Symonds, M. Barrows & Co., New York, 1963.

A Field Guide to the Ferns and Their Related Families, Boughton Cobb, Houghton Mifflin Co., Boston, MA, 1956.

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